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ABSTRACT

Evidence from 34 studies published since a 1983 review of 58 earlier studies underscores knowledge inequalities as an enduring phenomenon and emphasizes that interest in the knowledge gap phenomenon is accelerating. All 10 studies which varied "media publicity" supported the hypothesis. Eleven of 12 studies which varied some aspect of "media use" found knowledge gaps. Only a fraction of these studies varied media publicity and measured gaps at more than one time, which provides the best test of the classic knowledge gap hypothesis. Despite a multitude of findings on knowledge disparities, conditions under which changes in gaps occur still are not well documented. Twenty-two findings from 12 recent reports provide conflicting pictures. Without more measurements, better research designs, improved conceptualizations of the phenomenon and contingent conditions, and consistent attention to variation in mass media publicity, social scientists cannot hope to understand knowledge gap phenomena and address their implications. Since evidence for knowledge gaps is so abundant, future concentration on behavior gaps, value gaps, attitude gaps, may be more fruitful in improving the results of information campaigns, especially those concerning health and public affairs topics. (Contains 93 references, 6 notes, and 3 tables of data.) (RS)

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A Twenty-Five-Year Review of Knowledge Gap Research

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A TWENTY-FIVE-YEAR REVIEW OF KNOWLEDGE GAP RESEARCH

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Twenty-five years ago Tichenor, Donohue, and Olien (1970) introduced their landmark knowledge gap hypothesis in the pages of Public Opinion Quarterly, stimulating much debate and research. The hypothesis predicts that increased media publicity will exacerbate knowledge differentials between the "haves" and the "have-nots" over time. This paper assesses the recent body of findings this hypothesis has inspired and emphasizes that interest in the knowledge gap area is accelerating.

The work of the Tichenor-Donohue-Olien team and ensuing critiques and controversy helped to spur the rapid development of knowledge gap studies. This paper adds 34 new research reports to 58 studies with knowledge gap data examined in a 1983 article. The best test of the knowledge gap hypothesis occurs when media publicity of issues fluctuates, yet few studies have met this condition. Other key issues relevant to knowledge inequality are: differentials among media; levels of analysis; research designs; completion rates and generalizability; the role of motivation and interest; involvement or participation as behavioral measures; and inaccurate knowledge.

The old and new evidence together underscore knowledge inequalities as an enduring phenomenon. Yet, conditions under which changes in gaps occur are still not well documented.

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A TWENTY-FIVE-YEAR REVIEW OF KNOWLEDGE GAP RESEARCH

A quarter of a century has passed since Tichenor, Donohue, and Olién (1970) introduced their landmark knowledge gap hypothesis in the pages of Public Opinion Quarterly, stimulating more debate and research than have most theoretical ideas in the field of public opinion and mass communication research. The purpose of this paper is to assess the recent body of research findings this hypothesis has inspired.

The knowledge gap hypothesis formalized frequent early social science findings, especially in "diffusion of innovations" and rural sociology (P. J. Tichenor, personal communication, spring 1981; Tichenor, Donohue & Olien, 1970:160). The POQ article was based in part on Tichenor's Ph.D. dissertation (1965). Part of the rationale was that subsystems within a social system vary in speed of change in patterns of behavior, values, beliefs, or knowledge, and so forth, and therefore, gaps in behavior, values, etc., will appear over time ("a cumulative change model"). The hypothesis stated:

> As the infusion of mass media information into a social system increases, segments of the population with higher socioeconomic status tend to acquire this information at a faster rate than the lower status segments, so that the gap in knowledge between these segments tends to increase rather than decrease. (pp. 159-160)

The Tichenor-Donohue-Olien team emphasized their hypothesis concerned growth of differential knowledge, stressing that "have nots" do gain knowledge but "haves" acquire it at a greater rate. The relative gap between them grows, as a result. They assumed 1) growth of human knowledge is irreversible under the period of time they studied and 2) points of diminishing returns, or ceiling effects, either had not been reached or else occurred at varying rates for different socioeconomic status (SES) groups during the periods included.

The hypothesis predicted at a single point in time correlations would be higher between education and knowledge of topics publicized in mass media. Over

time, the operational definition of knowledge gap was education-based differences in the rate of knowledge gained (p. 163).

SES-related reasons augmenting differentials included: 1) communication skills, 2) amount of stored prior knowledge of relevant topics, 3) relevant social contact, such as activities, reference groups, and interpersonal discussion, 4) selective exposure, acceptance, and retention of information (which tend to be related to educational differences), and 5) the nature of the mass media information-delivery subsystems (p. 162). These reasons reflected social psychological underpinnings of the article (P. J. Tichenor, personal communication, January 3, 1995). The work of Tichenor, Donohue and Olien was oriented toward structural functionalism, an ascendant theory of that time (see: C. Gaziano & E. Gaziano, 1995).

The team foresaw both positive and negative consequences of disparities, stating that so-called failures of information campaigns to produce knowledge effects might actually be indications of greater effects on society by contribution to knowledge gaps. Differentials could be functional and positive for society if the most informed and well educated persons were guiding social change in the best interests of most citizens; yet, knowledge differentials between the "haves" and the "have-nots" could lead to increased social tensions between these groups. "A knowledge gap by definition implies a communication gap and a special challenge in resolving social problems" (p. 170). Later work and interaction with other researchers led the Tichenor-Donohue-Olien team to suggest conditions under which knowledge inequalities did not always occur, such as controversy, local impact, and smaller, less complex community structure (Tichenor, Rodenkirchen, Olien & Donohue, 1973; Donohue, Tichenor & Olien, 1975; Tichenor, Donohue & Olien, 1980; Olien, Donohue & Tichenor, 1983).

The knowledge gap notion became controversial. Principal challenges came from Ettema and Kline (1977) and Dervin (1980, 1989; Dervin & Nilan, 1986).

Ettema and Kline pointed to the role of motivation to acquire knowledge which is functional for the individual and to potential differences in worldviews of persons from different SES groups. Dervin argued that focus on knowledge gaps is analogous to blaming the victim, who has failed to get the message and that the model is based on the (faulty) traditional source-receiver model.

These differing perspectives can be placed within a four-celled typology, (E. Gaziano & C. Gaziano, 1994) which crosstabulates the unit of analysis (individual or collective) by how human phenomena are conceptualized (naturally occurring or socially constructed, according to Levine (1995). The theoretical orientations of Dervin, Ettema and Kline, and Tichenor, et al. each can be placed in a different table cell, which illustrates their different theoretical assumptions. The fourth cell of the typology is blank, inviting development.

The Body of Knowledge Gap Research

The ideas of the Tichenor-Donohue-Olien team and the critiques helped to spur the rapid development of knowledge gap investigations. By the end of the 1970s there were at least 10 studies specifically addressing knowledge differentials, not counting the work of Tichenor-Donohue-Olien. The 1970s total nearly doubled by 1989 (19, including 8 in foreign countries). By 1994, not even the midpoint of the decade, at least 29 had appeared (including 7 from other countries). Add to these the Minnesota Heart Health Project (MHHP) spanning the 1980s and part of the 1990s. There may be other studies not found during a literature search, especially from other nations. These numbers indicate sharply accelerated interest in the knowledge gap hypothesis.

A review article summed up the results of 58 studies with data appropriate to test the knowledge gap hypothesis or specifically designed to test it (C. Gaziano, 1983). The present effort adds 34 new research reports from published and unpublished sources designed to test the knowledge gap hypothesis, not

counting 10 pertinent studies carried out in developing countries in the 1980s and 1990s. Such studies differ greatly in media and social characteristics from those in developed countries and deserve a separate analysis (e.g., see Hornig, 1988, 1989). Examples are Snyder (1990) and Shingi, Kaur and Rai, reviewed by McDivitt (1983). Also omitted are inquiries from a related "gap" area, diffusion of innovations (e.g., Rogers, 1981; Scherer, 1989), since these studies tend to center on behavior, not knowledge, as the dependent variable.

Increasing Concern About Knowledge Gaps

Thirty-six studies specifically including knowledge gap phenomena were found in a search of work published or presented after the 1983 review, including a 1992 report (Simmons & Garda) not located previously. Two of the 36 studies are not included in the analysis.[1] These were: 1) Melwani, Viswanath, Becker, and Kosicki (1994), a time-trend study with a decreasing association over time between education and knowledge, although the topics were not comparable, and 2) Butler (1990), who found a knowledge gap declined in an experiment at two times two weeks apart, using advertisements for fictitious prescription drugs included both times with a pen and paper questionnaire (no media publicity or use involved; no variation in ad exposure).

Nineteen of 22 studies conducted at one time only found gaps, shown in Table 1. Only one reported no knowledge differentials (Zandpour & Fellow, 1992), and two had mixed findings both for gaps and no gaps (Frazier, 1986; Viswanath, Kosicki, Park & Fredin, 1993). Though Horowitz (1992) found a "reverse" gap for one topic, the overall pattern of differentials for four health issues she explored were in line with the hypothesis.

The MHHP campaign was counted as one study (Ettema, Brown & Luepker, 1983; Salmon, 1985; Viswanath, 1990; Viswanath, Finnegan, Hannan & Luepker, 1991; Viswanath, Finnegan, Hertog, Pirie & Murray, 1994). Pan (1990) and Miyo (1983;

also known as Miyo Mulugetta, 1986) approached the same data set in two different ways and are counted as separate efforts.

All 12 surveys with two or more measurements over time (Table 2) reported differentials. Score-keeping of gap changes showed no clear pattern for increases, decreases, or no changes (Table 3). Both the 1983 and the present analyses indicate gap findings in more than 80 percent of one-shot studies. Studies reporting no gaps (roughly 13%) or reverse gaps (about 5%) occurred in similar proportions in both periods. Among time-trend studies, no clear pattern was detected, although declining gaps occurred more often than other patterns in the earlier period but not as often in the present one.

Knowledge gaps clearly are enduring phenomena, especially in one-shot case studies. Simple scorekeeping of gap outcomes provides insufficient insight into the phenomenon. Qualitative study of conditions under which differentials change would give more guidance. Now, we turn to the eight most important issues emerging from analysis of the newer and earlier studies:

1) Variation in Mass Media Attention to Topics

The best test of the knowledge gap hypothesis occurs when media publicity of issues fluctuates. Only 5 of the 22 one-time investigations did this (Table 1). Only half of the 12 recent time-trend studies met this condition, as shown in Table 2. All of these 11 studies supported the knowledge gap hypothesis; one also did not support the hypothesis in one case. The amount of conflict on a fluoridation issue and attendant media coverage varied in four Minnesota communities studied by Frazier (1986), which contributed to decreased knowledge differentials. Knowledge gaps on a seat belt issue did occur; this topic was not controversial and media attention to it did not vary. Tichenor, et al. (1973) highlighted the role of conflict in formation of knowledge gaps (also see: Olien, Donohue & Tichenor, 1984).

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Most surveys did measure variation in media use, exposure, or similar variables, acceptable alternatives to media publicity variation, although not preferred, according to the hypothesis. Twelve studies varied some aspect of media use. Eleven reported gaps, and one found no gap (Table 1).

Turning to the reports in which no gaps, reverse gaps, declining gaps, or mixed findings were reported (tables 1 and 3), these seem to be the most likely explanations for such findings when media attention or use varies: presence of conflict (Frazier, 1986), more personal and immediate impact (perhaps, although explanations are not fully clear, Zandpour & Fellow, 1992), and low or declining media coverage (Horowitz, 1992; Griffin, 1990; Chew & Palmer, 1994; Miyo, 1983; Pan, 1990). Greater community size and complexity inhibited more equalized distribution of knowledge about cardiovascular disease over time in the MHHP campaign (Viswanath, 1990; Viswanath, et al., 1994; Viswanath, et al., 1991).

When publicity levels were unvaryingly high, explanations may be the following: an issue had community-wide and personal appeal (Viswanath, Kosicki, et al., 1993); ceiling effects may have been reached by some or all education groups although gaps between other education groups (i.e., low and medium) widened (Salmon, et al., 1994; Donohue, et al., 1990); statistical significance was not reached and findings may be an anomaly (Viswanath, Kahn, et al., 1993); and education, interest, and motivation together explained only a fraction of the variance in knowledge, indicating other, unmeasured variables may have been at work (Horstman, 1991). If these studies had varied media publicity or use, other results might have been obtained.

Several studies had hypotheses expanding upon the original one. They concerned the influence of newspaper "complexity" (number of foreign countries mentioned in a news story) and "readability" (number of long words and long sentences in a news story) on knowledge gaps (Kleinjenhuis, 1991), infographics complexity (number of dimensions depicted) (Pun, 1991); communication condition

(in-person presentation) (Nazarro, 1989), and comparison of metropolitan and non-metropolitan media (Tichenor, et al., 1987).

Rucinski and Ryu (1991) utilized social comparison theory (how people perceive their abilities in relation to others' abilities), respondents' self-assessments of their knowledge levels on U.S. policy in Nicaragua permitted classification into three groups, as perceived "aheads," "congruents," or "behinds." These self-determined labels corresponded with objectively measured information holding. The aheads tended to be predominantly male and of high SES, behinds were mostly female and of low SES, and congruents fell in between. SES measures included education, occupation, and income. Aheads were the most attentive to public affairs information and had the highest exposure to newspapers and television. Behinds were lowest in these areas. Even when issue salience was high among behinds, their levels of anticipated future information seeking were lower than others. Location in the social structure shaped respondents' media use, information holding, topic-related message discrimination in the media on the topic, and expectations of future information seeking. While this study did not directly test variations in media publicity on knowledge holding, it demonstrated ways in which social location fosters the growth of knowledge gaps. Their work explored some of the same "segmentation" ground as Wu (1992), whose work, influenced by Grunig (1989), was not designed to test the knowledge gap hypothesis directly but is relevant to knowledge gap theory. Education was used in a discriminant analysis to differentiate four publics; Wu then described their knowledge and other characteristics.

2) Differentials Among Media and Gaps

Pan, et al. (1994) found partial support for a hypothesis that a stronger learning effect of network TV and CNN News on Gulf War knowledge occurred for less educated respondents, compared with more educated ones. Tomita's work

(1990) showed cable television contributing to knowledge of less-educated news viewers, compared to less-educated non-cable viewers and non-news cable viewers. Chew and Palmer (1994) concluded that a one-time national television program reduced education- and interest-based knowledge differentials in a national sample, although their study had no control group.

When Miyo constrasted knowledge gaps within a group dependent on newspapers for news and another group dependent on television for news, the television dependent group had a slightly larger, though not statistically significant, knowledge gap. Kleinnijenhuis (1991) found knowledge gaps in three national Netherlands studies, to which newspaper reading contributed, mainly because of newspaper complexity and lack of readability. Television news did contribute to knowledge levels of the less educated more than it did to those of the more educated; however, the effect of television news on knowledge gaps was not examined.[2] Media attention can contribute to the knowledge of lower SES groups, yet not alleviate knowledge inequalities.

Interpersonal discussion of election topics played little role in augmenting knowledge of the less educated in Germany (Horstmann, 1991). Conflict, a primary ingredient in stimulating interpersonal discussion and mass media coverage of issues in the Tichenor-Donohue-Olien knowledge gap formulations, was not present in the "second-order elections" studied. In contrast, lack of interpersonal communication, as well as lack of mass media, helped to maintain lower levels of rural Alaskans' knowledge about the Persian Gulf War (Pearson, 1993). Viswanath and Finnegan (1991) and Pan and J. McLeod have placed emphasis on the role of interpersonal communication in differentials.

3) Level of Analysis

The Tichenor-Donohue-Olien team cast their hypothesis in terms of community-level variables; however, most knowledge gap studies examine

individual-level variables. When findings are inconsistent, inappropriate comparison of analytic level may be part of the reason. Debate over which level is "better" is not productive since both are valid. Some scholars think more emphasis should be on finding linkages between the two levels (Viswanath & Finnegan, 1991; Pan & J. McLeod, 1991). Further discussion of individual level research is below under the headings of "motivation" and "involvement."

Only a handful of researchers have studied community structure as a facilitator or inhibitor of knowledge gaps since earlier work by the Tichenor-Donohue-Olien team suggested that this variable affected knowledge inequalities (C. Gaziano, 1988). The MHHP found knowledge gaps were higher initially and widened more over time in more pluralistic communities than in less pluralistic ones, as discussed above. Pluralism referred to larger size and greater complexity or heterogeneity of social groups. Even though awareness knowledge gaps decreased, it was possible for depth knowledge gaps to increase (Viswanath, 1990). Awareness was having seen or heard something about the topic studied. Depth meant a composite score constructed from answers to several questions.

Use of metropolitan daily newspapers as information sources increased the size of knowledge gaps on local issues in comparisons of four other Minnesota communities (Tichenor, Olien & Donohue, 1987).[3] Also, Olien et al. (1990) found television appeared to augment knowledge differentials between metropolitan and non-metropolitan communities, even for local public affairs issues. Frazier's 1986 study of four Minnesota communities focused on intensity of conflict rather than complexity of structure. Community size (no other community indicators included) had little impact on true-transmission AIDS/HIV knowledge gaps in the large, national secondary data-analysis by Salmon, et al. (1994). A small and narrowing gap developed for false-transmission knowledge.

4) Research Design

Most knowledge gap reports have been one-shot case studies, as defined by Campbell and Stanley (1963), who described them as fraught with problems of external and internal validity.

Elaboration on time-trend designs. Two studies used a Solomon Four-Group Design, or combination of panel and cross-sectional design, to combat internal and external validity problems. One of these found decreasing gaps (Griffin, 1990), and so far, the MHHP reports have concerned the cross-sectional data only, which are vulnerable to certain threats to validity. Three other endeavors utilized separate sample pretest-posttest designs, which provide many external and internal validity protections (Salmon, et al., 1994; Donohue, et al., 1990; and Olien, et al., 1990). Viswanath, Kahn, et al. (1993) chose a non-equivalent comparison group design with two randomized cross-sections, good for most internal validity problems but less helpful for external validity.

The panel data of Pan (1990) and Miyo (1983)/Mulugetta (1986), as well as Moore (1987) and Horstmann (1991), were subject to some threats to internal and external validity. The study by Pan, et al. (1994) might be considered pre- and posttest separate samples with mixed success in controlling for internal validity and better control of external validity, but it is problematic because they mixed a national sample and a state sample. Chew and Palmer (1994) reported that budget constraints allowed inclusion of only those respondents who saw a televised health program, not the non-viewers. This left them with a pretest-posttest panel design, prey to many kinds of threats to validity. Their statistical analysis primarily was comparison of correlation coefficients, whereas repeated measures analysis would have helped to control for instrumentation effects.

Few knowledge gap studies conform to the Solomon Four-Group model described by Chaffee, Roser and Flora (1989). Drawing on their knowledge of the Stanford

Heart Disease Prevention Program in several central California cities in the late 1970s and 1980s, they discussed threats to validity in communication campaigns. They diagrammed a four-celled table cross-tabulating testing and maturation effects (panels versus cross-sections) with campaign community respondents and non-campaign community respondents, a quasi-experimental design because the comparison and campaign cities cannot be randomized (p. 300). The obtained results in the four table cells will be the campaign effect, the testing and maturation effect, and the sensitization effect.

Chaffee, et al., pointed out that choice of comparison cities poses a major problem when controlling for selection threats to validity because of the great difficulty in "matching" communities on variables important to the research. Lack of equivalence on relevant variables can destroy confidence in results. The MHHP surveys were subject to this problem to some degree (e.g., Salmon, 1985). Future publication of their data using both panel and cross-section samples will allow assessment of the degree to which this was a problem.

As pointed out above, other designs control well for various threats to validity, but one must keep in mind design flaws in many studies in the literature which can account for findings. Most knowledge gap accounts do not discuss pros and cons of their designs, nor do they always report completion rates and other information which can help us assess their representativeness.

5) Completion Rates and Generalizability

Of the knowledge inequality studies considered here, only these researchers reported completion rates of 65% or more: Fredin, Monnett, and Kosicki (1994); Lovrich and Pierce (1984); the MHHP reports; Viswanath, Kahn, et al. (1993); Moore (1987); Pan, et al. (1994); Pearson (1993); Salmon, et al. (1994); and Zandpour and Fellow (1992).[4] Several studies with relatively lower response rates strengthened their designs by comparing communities (Frazier, 1986), media

publicity and topics (Horowitz, 1992), and ethnic groups (Gandy & El Waylly, 1985). Several authors stated that methodological details could be obtained in other published accounts (Brantgaard, 1983; Horstmann, 1991; Kleinijenhuis, 1991; Tichenor, et al., 1987). A few did not involve random samples (Nazarro, 1989; Pun, 1991; Simmons & Garda, 1992. Very few studies provided data such as census figures to compare with sample distributions, in order to bolster confidence that their samples were representative.

The paired parent-adolescent panel sample of Pan (1990) and Miyo/Mulugetta suffered a 49% attrition rate. Not enough was known about the original sample to estimate characteristics of dropouts, as Pan pointed out (pp. 81, 104). The panel study reported by Chew and Palmer (1994) also had a high attrition rate.

One of the most frequent problems in knowledge gap research is lack of representativeness of samples, compared to the population from which they were drawn. A common difficulty in the group of studies discussed here is over-representation of higher SES respondents,[4] which may be due partly to respondent selection procedures and may be linked partly to non-response biases (e.g., people of higher SES may be more willing to be interviewed), or other methodological issues. Disproportionate representation of lower SES respondents inhibits our ability to evaluate knowledge gap processes. In the future, it would be advisable to over-sample lower SES groups.

Simmons and Garda (1982) used a quota sample, open to the biases of such samples, although they defended this choice. Quota sample flaws may be present in the 1954 and 1957 Gallup trend data of Donohue, et al (1990), which were compared with data from 1969, 1977, and 1981, when sampling was considered to be more accurate.

6) The Role of Motivation, Interest, and Related Variables

As Ettema and Kline (1977) argued, involvement, motivation, interest,

salience, or similar variables can contribute to knowledge gap reduction, but this does not always happen. These have been studied on both individual and collective levels, sometimes described as "micro" and "macro" levels (Pan & J. McLeod, 1991; E. Gaziano & C. Gaziano, 1994; C. Gaziano & E. Gaziano, 1995). Pan and J. McLeod have argued for "cross-level linkages" between individual and collective levels of analysis and have offered several illustrations of these (1991:154). Much more work remains to be done to clarify the influence of such concepts -- to describe conditions under which they help to narrow gaps or not, specifications of levels of analysis (individual or collective), and type of construct (attitude, behavior, knowledge, etc.).

For example, "involvement" has been used in an individual psychological sense and in a collective, community-level sense (Viswanath, et al., 1991). Involvement has been operationalized as an attitudinal variable and as a behavioral one. Interest can pertain to self-interest, reference group interest, membership group interest, and so forth, as well as behavioral indicators. Sometimes studies combine behavioral and attitude measures to create a single variable. Great care should be taken to sort out all of these issues when planning knowledge gap research or interpreting results because these kinds of variables in the literature to date are greatly muddled. Further, direction of causation is not clear (Horstmann, 1991). Perhaps motivation leads to more knowledge (Viswanath & Finnegan, 1991), or perhaps the relationship is reciprocal, as the work of Pan (1990) suggests. These observations apply to many other variables studied in knowledge gap work.

When analysis is on the individual level, what consequences does this have for potential remedies? How should differences in interest or motivation be conceptualized? Should they be viewed as "differences" or "deficits" or some other way? If our research finds individuals are lacking in interest or

motivation, are we "blaming the victim," or are there other ways of conceptualizing this issue? What are the consequences of our theoretical conceptualizations for problem solving? On what solutions will we be more likely to focus? Which solutions will we miss? If we are working on a community level or a societal level, how does that change the answers to the last two questions?

The interrelationships of independent variables need to be clarified. For example, Genova and Greenberg (1979) reported interest was more strongly related to knowledge than was education, but the correlation between interest and education was not given. Often, education and motivation or interest are related (Rucinski & Ryu, 1991; Viswanath & Finnegan, 1991; C. Gaziano, 1984). Knowing more about the relationship might aid in understanding the gap phenomenon.

Lovrich and Pierce (1984) reported motivational variables were more important than education in relationship to modest knowledge gaps on water resource use and policy in Idaho. Occupation, often a component of SES, was related to knowledge with regard to respondents' whose occupations predisposed them to acquire water issue knowledge (such as agriculture/farming). Their motivational variables measured both behavior (use of water resources and participation in water politics) and attitudes (policy satisfaction, perception of importance, intensity of policy orientations). Occupations linked to water issues could be considered indicators of issue interest, as well as SES indicators. Other investigators may wish to consider how employment in certain occupations impinges on various types of knowledge.

Choe (1986) found "situational variables" worked with education to explain knowledge gaps on national budget deficit issues in Athens County, Ohio, because the less educated tended to be fatalistic and the more educated tended to be more oriented toward problem solving. Similarly, D. McLeod and Perse (1994)

noted education and income were related to political interest (attitudinal variable), community involvement or participation (behavioral variable), and other variables which contributed to knowledge deficits. Butler (1990) concluded that "transsituational variables," such as education, sex, and age were much more strongly related to information acquisition about prescription medicines in an experimental setting than were situational variables.

In West German election panel studies, feeling well informed and desiring more information and formal education accounted less well for decreases in knowledge gaps than did "political interest" (measured on a seven-point scale of political participation -- suggesting a behavioral rather than an attitudinal variable) (Horstmann, 1991). The lower the education, the greater the influence of motivation on closing gaps. U.S. studies of participation often find, however, that high SES is related to higher participation in organizations (e.g., Milbrath and Goel, 1977).

Race and ethnic identification worked in opposite ways as indicators of motivation or interest in news of Palestinian-Israeli conflict (Gandy and El Waylly, 1985). Lack of education was a knowledge barrier for blacks in the Washington, D.C., metropolitan area, and high education facilitated knowledge among Jewish respondents. Race and ethnic identification (Hispanic) made little difference in a study of alcohol-related information in Orange County, California (Zandpour and Fellow, 1992). (The latter study confounded race with Hispanic ethnic identity, somewhat flawing analysis.) Salmon, et al. (1994) found race made little difference in knowledge of AIDS transmission but it did play a role in widening gaps in inaccurate beliefs about ways in which HIV is transmitted.

Motivation or involvement can be related to topics but not always. In general, the more distant public affairs topics are from individuals in time and

space, the greater the likelihood of education-based knowledge differentials (C. Gaziano, 1983). Knowledge gaps might be less likely to occur on home energy and health topics, for example; however, results are mixed on these topics. The less educated were thought to be more interested than others in home energy issues and more knowledgeable about those issues because they tended to live in older, less energy-efficient homes in West Allis, Wisconsin (Griffin, 1990). Instead, energy gaps emerged. Among the less educated, however, knowledge gain was associated with discussion or with attention to TV energy commercials for at least a portion of the four-wave study period.

Membership in a group at risk for certain health problems does not insure education-based health knowledge gaps will decline (Salmon, et al., 1994; Nazarro, 1989). Although a pilot study for the Minnesota Heart Health Project found being older and perceiving oneself at risk for heart attack helped to decrease gaps (Ettema, Brown & Luepker, 1983), none of the later reports on various phases of the 13-year MHHP found these or similar variables to mitigate gaps, contrary to expectations (Salmon, 1985; Viswanath, 1990; Viswanath, Kahn, et al., 1993; Viswanath, et al., 1991; Finnegan, Viswanath, Hannan, Weisbrod & Jacobs, 1989). On the other hand, the MHHP investigators discovered direct mail appeals helped to heighten health awareness of a hard-to-reach group, less educated males (Finnegan, Loken & Pitney, 1987).

In a knowledge gap survey of a related diet and health topic transmitted by a single television program, Chew and Palmer (1994) argued that interest-based knowledge gaps declined more than education-based gaps, according to comparison of correlation coefficients for a national sample. Interest and education gaps were very small and similar in magnitude, however.

Pan (1990) probed ways in which inequalities in knowledge gain can be transmitted by one generation to the next, looking at parent-adolescent pairs in Wisconsin during the 1980 Presidential campaign. Disparities in news media use

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and in campaign interest helped to explain knowledge gaps, but he concluded that there are also ways in which campaign interest and news media use can change, independent of SES relationships.

A variable somewhat related to interest and motivation but functioning differently is "disaffection," triggered by news, which seems to lead to more, rather than less knowledge among the disaffected (Fredin, Monnett, and Kosicki, 1994). In a path analysis, greater attention among well-educated women to a high-conflict issue (schools) led to lower trust in government, related to "schemata" implying lower assessment of news media quality and leading to more knowledge. They concluded that this effect was a gap of disaffection, triggered predominantly by news (although this gap could be seen as rooted in social stratification and re-conceptualized on a community level).

7) Involvement or Participation as Behavioral Measures.

Frazier (1986) measured level of involvement in fluoridation and seat belt issues as number of actions taken on those issues in four Minnesota communities. She obtained support for education-based participation gaps which was not statistically significant for fluoridation (the more controversial issue) but which was significant for seat belts in two communities. In both of the latter two communities, respondents with medium education were the most active.

Education-based participation gaps mirrored knowledge gaps in a large, heterogeneous Minneapolis inner-city neighborhood in a study of four local issues (C. Gaziano, 1984). Participation meant taking part in any neighborhood organization's activities. Such involvement was a source of information about the issues; in addition, more educated respondents had more information sources.

Community group involvement, as well as strength of community ties, was expected to decrease crime control knowledge gaps in a Franklin County, Ohio, survey, but that did not occur (Viswanath, Kosicki, et al., 1993). The authors

thought, however, that group involvement and community ties might contribute to decreased knowledge gaps on other topics.

The link between knowledge gaps and behavior gaps seldom has been explored, although such a link can have very important implications. Salmon, et al. (1994), stated that although a need persists for more distribution of information on AIDS/HIV throughout communities as people age, move through the life cycle, and alter their relationships and environments, lack of information is not the problem so much as is lack of action on the information, they said. Moore (1987) concluded changes in knowledge and knowledge gaps influenced voters to change preferences for gubernatorial candidates in New Hampshire regarding one issue but not another. He suggested high and low educated groups have different S-curves of information diffusion; the point at which an election occurs may affect the size of the knowledge and participation gaps. He hypothesized that the later in the campaign process the election comes, the smaller the gaps. This remains to be confirmed by research.

8) Inaccurate Knowledge

Few knowledge gap inquiries measure inaccurate knowledge. All four communities in Frazier's study (1986) had misinformation gaps on the conflict-laden issue of fluoridation. The gap was widest in the highest controversy community. Although conflict helped to narrow differentials on accurate knowledge of the issue per se in Brainerd, it also led to widened misinformation gaps on that issue, particularly on accurate technical knowledge.

Salmon, et al. (1994) used an index of six items to form a false transmission information index for the AIDS issue (belief that any of the following could transmit AIDS: working near someone with AIDS, eating in a restaurant with an employee infected with AIDS, using public toilets, being coughed or sneezed on by someone with AIDS, and attending school with a child

who has AIDS). Such inaccurate items can lead to unnecessary fear and avoidance of non-risky behaviors and discrimination against people with HIV/AIDS.[5]

Conclusions

Evidence from 34 studies published since the 1983 review of 58 earlier studies underscores knowledge inequalities as an enduring phenomenon and emphasizes that interest in the knowledge gap phenomenon is accelerating. All ten studies which varied media publicity supported the knowledge gap hypothesis. Eleven of twelve studies which varied some aspect of media use found knowledge gaps; one found no gap. Only a fraction of these studies varied media publicity and measured gaps at more than one time, which provides the best test of the classic knowledge gap hypothesis. When knowledge differentials declined or were small, the same kinds of conditions as found in the 1983 summary of research tended to explain results: presence of conflict, local scope of issue, less community complexity. As observed earlier, both increased and decreased media publicity can contribute to reduced gaps. When increased publicity concerns conflict or local topics, knowledge may be equalized throughout a community. When publicity declines, forgetting may occur often, leading to narrowed gaps. No new variables which may make a difference in gaps were uncovered, although much research suggests some promising directions. More research is needed on inaccurate knowledge, the role of broadcast media (radio is neglected in most research), the impact of prior knowledge, and the stage set for research by the level of analysis selected. Studies such as those by Rusinski and Ryu (1991) and Wu (199Ø) contribute a potentially beneficial social market segmentation model.

Despite a multitude of findings on knowledge disparities, conditions under which changes in gaps occur still are not well documented. Twenty-two findings from twelve recent reports on knowledge gap patterns over time provide

conflicting pictures. The best designed examination of knowledge gaps over time (the MHHP), suggests that differentials wax and wane fluidly across time (findings from cross-sectional samples only). Most studies of knowledge inequalities capture a brief snapshot of the process at only one or two points. Without more measurements, better research designs, improved conceptualizations of the phenomenon and contingent conditions, and consistent attention to variation in mass media publicity, social scientists cannot hope to understand knowledge gap phenomena and address their implications. With increasing SES gaps developing in the past couple of decades (Wolff, 1994) and signs that the federal government may institute policies which can widen SES disparities, SES-based knowledge gaps loom ever larger in research and policy importance.

Furthermore, if print contributes more to knowledge acquisition, as much research indicates, and newspaper reading is declining over time (Newspaper Association of America, 1994), what are the long-term implications for SES-based knowledge differentials, or for the United States as a world power? Are overall levels of public affairs knowledge are declining over time in the U.S.?

Finally, since evidence for knowledge gaps is so abundant, future concentration on behavior gaps, value gaps, attitude gaps and their interrelationships, as well as their linkages to knowledge gaps, may be more fruitful in improving the results of information campaigns, especially those concerning health and public affairs topics. Some of the blueprints for increased quality of theory and research are present in the knowledge gap literature. Better theoretical integration and innovative approaches have the ultimate potential to improve the quality of life worldwide.

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Notes

1. Not included are primarily philosophical discussions rather than data presentations, e.g., Asp (1986) or Cairns (1984) who labeled his research on children of Northern Ireland "knowledge gap" without any reference to the knowledge gap literature. Sharp (1984) referred to knowledge gaps but her data concerned media use instead; thus, her study is not counted here.

2. Equalizing the distribution of knowledge within a social subsystem, however, does not ensure equal knowledge exposure or acquisition (Tichenor et al., 1973). Exposure to information sources, especially to print media, often is found to be related to SES (Berry, 1992; Pan, 1990; Gandy & El Waylly, 1985; Finnegan, Viswanath, Kahn & Hannan, 1993; Rucinski & Ryu, 1991). Having a greater number of information sources frequently is correlated with SES and knowledge gaps (Viswanath, 1990; C. Gaziano, 1984). The knowledge gap is one aspect of larger socioeconomic gaps in society (C. Gaziano, 1989).

3. Donohue, Tichenor, and Olien (1986) compared 1965 and 1979 daily newspaper circulation with media use data from 34 studies of 28 Minnesota communities, measuring a readership gap as a condition for knowledge gaps between communities. Reduction of metropolitan newspaper circulation was related to less complex county social structure. Regional newspapers did not fill the circulation void well or at all in cases, as the metropolitan daily (Minneapolis Star and Tribune) pulled back its circulation from less lucrative, more rural areas. Education and reading were more correlated for metropolitan papers than for smaller, local papers. Also see: Donohue, Olien and Tichenor (1987).

4. At least 11 studies over-represented higher SES groups in the total sample or in a significant subsample (Chew & Palmer, 1994; Frazier, 1986; Gandy & El Waylly, 1985; Griffin, 1990; Horowitz, 1992; some portions of the MHHP surveys; D. McLeod & Perse, 1994; Pan, et al., 1994; Tomita, 1989; Wanta & Elliott, 1992). Pearson (1993) noted his telephone survey of rural, small urban, and Anchorage subsamples underrepresented rural households, which often lacked phones.

5. Jacoby and Hoyer (1982), in a large-scale study of miscomprehension of commercial and non-commercial televised communication, found only two demographic variables significantly but modestly related to miscomprehension, age and education. Stroman and Seltzer (1989) found newspaper readers to be more knowledgeable and television news viewers to be more likely to be misinformed, although they did not conceptualize their data in knowledge gap terms. In Britain, education-based differences in information processing and cognitive styles may foster miscomprehension of television news (Gunter, 1987).

6. Figures from the Research Department, Newspaper Association of America, showing 80.8% U.S. adults' average weekday readership of newspapers in 1964, compared with 61.5% of U.S. adults' average weekday readership in 1994. Figures for men are slightly higher than for women. Average adults' Sunday readership was 75.3% in 1964, dipping to a low of 64.0% in 1988, rising to 70.4% in 1994.

References

Abrahamsson, Kenneth. 1982. "Knowledge gaps, bureauracy, and citizen participation: Towards alternative communication models." Communication 7 (1):75-102.

Asp, K. 1986. Maktiga massmedier (Powerful mass media). Stockholm: Akademilitterature.

Berry, Michelle Courtney. 1992. What matters most in predicting health knowledge - Media use, group participation, socioeconomic status or race variables. Unpublished M.P.S. thesis, Cornell University.

Brantgarde, Lennart. 1983. "The information gap and municipal politics in Sweden." Communication Research 10(3):357-373.

Butler, Nadine Carol. 1990. An investigation of direct-to-consumer prescription drug advertising in terms of the knowledge gap hypothesis. Unpublished Ph.D. dissertation, University of Minnesota.

Cairns, E. 1984. "Television news as a source of knowledge about the violence for children in Ireland: A test of the knowledge-gap hypothesis." Current Psychological Research and Reviews 3 32-38.

Campbell, Donald T., and Julian C. Stanley. 1963. Experimental and quasi-experimental designs for research. Chicago: Rand McNally College Publishing Co.

Chaffee, Steven H., Connie Roser, and June Flora. 1989. Estimating the magnitude of threats to validity of information campaign effects. In Information campaigns: Balancing social values and social change. Edited by Charles T. Salmon. 285-301. Newbury Park, CA: Sage.

Chew, Fiona, and Sushma Palmer. 1994. "Interest, the knowledge gap, and television programming." Journal of Broadcasting & Electronic Media 38 (3):271-287.

Choe, Yunhee. 1986. Situational variables in perception and information regarding public affairs. Unpublished Ph.D. dissertation, Ohio University, Athens.

Delli Carpini, Michael X., Scott Keeter, and J. David Kennamer. 1994. "Effects of the news media environment on citizen knowledge of state politics and government." Journalism Quarterly 71(2):443-456.

Dervin, Brenda. 1980. Communication gaps and inequities: Moving toward a reconceptualization. In Progress in communication sciences. Edited by Brebda Dervin and Melvin J. Voight. 73-112. Norwood, NJ: Ablex.

Dervin, Brenda, and Michael Nilan. 1986. "Information needs and uses." Annual Review of Information Science and Technology 21 3-33.

Dervin, Brenda. 1989. "Users as research inventions: How research categories perpetuate inequities." Journal of Communication 39(3):216-232.

Donohue, George A., Phillip J. Tichenor, and Clarice N. Olien. 1975. "Mass media and the knowledge gap: A hypothesis reconsidered." Communication Research 2(1):3-23.

Donohue, George A., Phillip J. Tichenor, and Clarice N. Olien. 1986. "Metro daily pullback and knowledge gaps: Within and between communities." Communication Research 13(3):453-471.

Donohue, G. A., C. N. Olien, and P. J. Tichenor. 1987. "Media access and knowledge gaps." Critical Studies in Mass Communication 4(1):87-92.

Donohue, G. A., C. N. Olien, and P. J. Tichenor. 1990. "Knowledge gaps and smoking behavior." Paper presented to the American Association for Public Opinion Research, Lancaster, PA.

Ettema, James S., and F. Gerald Kline. 1977. "Deficits, differences, and ceilings: Contingent conditions for understanding the knowledge gap." Communication Research 4(2):179-202.

Ettema, J. S., J. W. Brown, and R. V. Luepker. 1983. "Knowledge gap effects in a health information campaign." Public Opinion Quarterly 47(4):516-527.

Finnegan Jr., John R., Barbara Loken, and Beth Howard-Pitney. 1987. "Using direct mail to bridge 'knowledge gaps' in communication about health." Journal of Direct Marketing 1(3):26-39.

Finnegan Jr., John R., K. Viswanath, Peter J. Hannan, Rita Weisbrod, and David R. Jacobs Jr. 1989. "Message discrimination: A study of its use in a campaign research project." Communication Research 16(6):770-792.

Frazier, Perley Jean. 1986. Community conflict and the structure and social distribution of public opinion. Unpublished Ph.D. dissertation, University of Minnesota.

Fredin, Eric S., Teresa Haugen Monnett, and Gerald M. Kosicki. 1994. "Knowledge gaps, social locators, and media schemata: gaps, reverse gaps, and gaps of disaffection." Journalism Quarterly 71(1):176-190.

Gandy Jr., Oscar H., and Mohamed El Waylly. 1985. "The knowledge gap and foreign affairs: The Palestinian-Israeli conflict." Journalism Quarterly 62 (4):777-783.

Gaziano, Cecilie. 1983. "The knowledge gap: An analytical review of media effects." Communication Research 10(4):447-486.

Gaziano, Cecilie. 1984. "Neighborhood newspapers, citizen groups and public affairs knowledge gaps." Journalism Quarterly 61(3):556-566,599.

Gaziano, Cecilie. 1988. "Community knowledge gaps." Critical Studies in Mass Communication 5(4):351-357.

Gaziano, Cecilie. 1989. "Mass communication and class communication." Mass Comm Review 16(3):29-38.

Gaziano, Cecilie, and Emanuel Gaziano. 1995. Theories and methods in knowledge gap research since 1970. In An integrated approach to communication theory and research. Edited by Michael B. Salwen and Don W. Stacks. Hillsdale, NJ: Erlbaum.

Gaziano, Emanuel, and Cecilie Gaziano. 1994. "Collective voluntarism and public affairs knowledge." Paper presented to the Midwest Association for Public Opinion Research, Chicago, IL.

Genova, B. K. L., and Bradley S. Greenburg. 1979. "Interests in news and the knowledge gap." Public Opinion Quarterly 43(1):79-91.

Griffin, Robert J. 1990. "Energy in the eighties: Education, communication, and the knowledge gap." Journalism Quarterly 67(3):554-566.

Grunig, James E. 1989. Publics, audiences and market segments: Segmentation principles for campaigns. In Information campaigns: Balancing social values and social change. Edited by C. T. Salmon. 199-228. Newbury Park, CA: Sage.

Gunter, Barrie. 1987. Poor reception: Misunderstanding and forgetting broadcast news. Hillsdale, NJ: Erlbaum.

Hornik, Robert C. 1988. Development communication: Information, agriculture and nutrition in the Third World. New York: Longman.

Hornik, Robert. 1989. The knowledge-behavior gap in public information campaigns: A development communication view. In Information campaigns: Balancing social values and social change. Edited by C. T. Salmon. 113-138. Newbury Park, CA: Sage.

Horowitz, Alice Munkhoff. 1992. Gaps in knowledge among women about gynecologic and colorectal cancer screening procedures. Unpublished Ph.D. dissertation, University of Maryland, College Park.

Horstmann, Reinhold. 1991. "Knowledge gaps revisited: Secondary analyses from Germany." European Journal of Communication 6(1):77-93.

Jacoby, Jacob, and Wayne D. Hoyer. 1982. "Viewer miscomprehension of televised communication: selected findings." Journal of Marketing 46(4):12-26.

Kleinnijenhuis, Jan. 1991. "Newspaper complexity and the knowledge gap." European Journal of Communication 6(4):499-522.

Levine, Donald N. 1995. Visions of the sociological tradition. Chicago: University of Chicago Press.

Lovrich Jr., Nicholas P., and John C. Pierce. 1984. "'Knowledge gap' phenomena: Effect of situation-specific and transsituational factors." Communication Research 11(3):415-434.

McDivitt, Judith A. 1983. "Closing the gap: book review of Television and Knowledge Gap Hypothesis by Shingi, Kaur & Rai." Journal of Communication 33(4):94-96.

McLeod, Douglas M., and Elizabeth M. Perse. 1994. "Direct and indirect effects of socioeconomic status on public affairs knowledge." Journalism Quarterly 71(2):433-442.

Melwani, Geetu, K. Viswanath, Lee B. Becker, and Gerald M. Kosicki. 1994. "Community complexity and knowledge gaps: a longitudinal study of one community." Paper presented to the Midwest Association for Public Opinion Research, Chicago.

Milbrath, Lester W., and M. L. Goel. 1977. Political participation: How and why do people get involved in politics? 2nd ed. Chicago: Rand McNally.

Miyo, Yuko. 1983. The knowledge-gap hypothesis and media dependency. In Communication Yearbook 7. Edited by Robert N. Bostrom. 626-650. Beverly Hills: Sage.

Moore, David W. 1987. "Political campaigns and the knowledge gap hypothesis." Public Opinion Quarterly 51(2):186-200.

Mulugetta, Yuko Miyo. 1986. Knowledge gap hypothesis and media preference. Unpublished Ph.D. dissertation, University of Wisconsin-Madison.

Nazzaro, Ann-Marie. 1989. The knowledge gap hypothesis and salience in the context of health maintenance organizations and the elderly. Unpublished Ph.D. dissertation, University of Pennsylvania.

Newspaper Association of America. 1994. Newspaper readership trends - daily, Sunday. 711 Third Avenue, New York, NY 10017.

Olien, C. N., G. A. Donohue, and P. J. Tichenor. 1983. Structure, communication and social power: Evolution of the knowledge gap hypothesis. In Mass communication review yearbook. Edited by E. Wartella, D. C. Whitney and S. Windahl. Beverly Hills, CA: Sage.

Olien, Clarice N., George A. Donohue, and Phillip J. Tichenor. 1984. "Media and states of social conflict." Journalism Monographs 90.

Olien, C. N., G. A. Donohue, and P. J. Tichenor. 1990. "Media mix and the metro-nonmetro knowledge gap: Information deprivation in an information age?" Paper presented to the Midwest Association for Public Opinion Research, Chicago, IL.

Pan, Zhongdang. 1990. Inequalities in knowledge acquisition from mass media: Cross-generational changes and maintenance. Unpublished Ph.D. dissertation, University of Wisconsin-Madison.

Pan, Zhongdang, and Jack M. McLeod. 1991. "Multilevel analysis in mass communication research." Communication Research 18(2):140-173.

Pan, Zhongdang, Ronald E. Ostman, Patricia Moy, and Paula Reynolds. 1994. "News media exposure and its learning effects during the Persian Gulf War." Journalism Quarterly 71(1):7-19.

Pearson, Larry. 1993. Desert Storm and the Tundra Telegraph: Information diffusion in a media-poor environment. In Desert storm and the mass media. Edited by Bradley S. Greenberg and Walter Gantz. 182-196. Cresskill, NJ: Hampton Press.

Price, Vincent, and John Zaller. 1993. "Who gets the news? Alternative measures of news reception and their implications for research." Public Opinion Quarterly 57(2):133-164.

Pun, Wai Hung. 1991. News infographics and knowledge gap. Unpublished M.A. thesis, University of Texas-Austin.

Rogers, Everett M. 1983. Diffusion of innovations. 3rd ed. New York: Free Press.

Rucinski, Dianne, and Choon Ryu. 1991. "Social comparison and the knowledge gap." Paper presented to the International Communication Association, Chicago, IL.

Salmon, Charles T. 1985. The role of involvement in health-information acquisition and processing. Unpublished Ph. D. dissertation, University of Minnesota.

Salmon, Charles T., Karen Wooten, Eileen Gentry, Galen Cole, and Fred Kroger. 1994. "AIDS knowledge gaps in the first decade of the epidemic." Paper presented to the International Communication Association, Sydney, Australia.

Scherer, Clifford W. 1989. "The videocassette recorder and information inequity." Journal of Communication 39(3):94-103.

Sharp, Elaine B. 1984. "Consequences of local government under the Klieg lights." Communication Research 11(4):497-517.

Shingi, Prakash M., Gurinder Kaur, and Ravi Prakash Rai. 1982. "Television and knowledge-gap hypothesis." Centre for Management in Agriculture, Indian Institute of Management, Ahmedabad, India. NTIS, CMA Monograph 82.

Simmons, Robert E., and Eduardo Carlos Garda. 1982. "Dogmatism and the 'knowledge gap' among Brazilian mass media users." Gazette 30(2):121-133.

Snyder, Leslie B. 1990. "Channel effectiveness over time and knowledge and behavior gaps." Journalism Quarterly 67(4):875-886.

Stroman, Carolyn A., and Richard Seltzer. 1980. "Mass media use and knowledge of AIDS." Journalism Quarterly 66(4):881-887.

Thunberg, A., K. Nowak, K. E. Rosengren, and B. Sigurd. 1982. Communication and equality: A Swedish perspective. Stockholm: Almqvist and Wiksell.

Tichenor, Phillip J. 1965. Communication and knowledge of science in the adult population of the U.S. Unpublished Ph.D. dissertation, Stanford University.

Tichenor, Phillip J., George A. Donohue, and Clarice N. Olien. 1970. "Mass media flow and differential growth in knowledge." Public Opinion Quarterly 34 (2):159-170.

Tichenor, Phillip J., Jane M. Rodenkirchen, Clarice N. Olien, and George A. Donohue. 1973. Community issues, conflict, and public affairs knowledge. In New models for mass communication research. Edited by Peter Clarke. 45-79. Beverly Hills, CA: Sage.

Tichenor, Phillip J., George A. Donohue, and Clarice N. Olien. 1980. Community conflict and the press. 175-203. Beverly Hills, CA: Sage.

Tichenor, Phillip J., Clarice N. Olien, and George A. Donohue. 1987. "Effect of use of metro dailies on knowledge gap in small towns." Journalism Quarterly 64(2-3):329-336.

Tomita, Machiko Rachel. 1989. The role of cable television in providing information on world news: A test of the knowledge gap hypothesis (television). Unpublished Ph.D. dissertation, University of Minnesota.

Viswanath, Kasisomayajula. 1990. Knowledge gap effects in a cardiovascular disease prevention campaign: A longitudinal study of two community pairs. Unpublished Ph.D. dissertation, University of Minnesota.

Viswanath, K., and John Finnegan Jr. 1991. "The knowledge gap hypothesis: Twenty years later." Paper presented to the International Communication Association, Chicago, IL.

Viswanath, K., J. R. Finnegan Jr., P. J. Hannan, and R. V. Luepker. 1991. "Health and knowledge gaps: Some lessons from the Minnesota Heart Health Program." American Behavioral Scientist 34(6):712-726.

Viswanath, K., Emily Kahn, John R. Finnegan Jr., James Hertog, and John D. Potter. 1993. "Motivation and the knowledge gap: Effects of a campaign to reduce diet-related cancer risk." Communication Research 20(4):546-563.

Viswanath, K., Gerald Kosicki, Eunkyung Park, and Eric Fredin. 1993. "Community involvement, community-boundedness and knowledge gaps." Paper presented to the Midwest Association for Public Opinion Research, Chicago, IL.

Viswanath, K., John R. Finnegan Jr., James Hertog, Phyllis Pirie, and David M. Murray. 1994. "Community type and the diffusion of campaign information." Gazette 54(1):39-59.

Wanta, Wayne, and William R. Elliott. 1992. "Did the 'Magic' work? Knowledge of HIV/AIDS and the knowledge gap hypothesis." Paper presented to the International Communication Association, Miami, FL.

Wolff, Edward N. 1994. "Trends in household wealth in the United States, 1962-83 and 1983-89." Review of Income and Wealth 40 (2):143-174.

Wu, Yi-Chen. 1992. Situational theory and the publics of a communication campaign of earthquake preparedness: A discriminant analysis. Unpublished Ph.D. dissertation, Southern Illinois University.

Yows, Suzanne R., Charles T. Salmon, Robert P. Hawkins, and Richard R. Love. 1991. "Motivational and structural factors in predicting different kinds of cancer knowledge," American Behavioral Scientist, 34(6):727-741.

Zandpour, Fred, and Anthony R. Fellow. 1992. "Knowledge gap effects: Audience and media factors in alcohol-related health communications." Mass Comm Review 19(3):34-41.

TABLE 1
Knowledge Gap Findings for One-Shot Studies by Media Publicity or Exposure

I. Gap found	No. of issues	
A. High publicity		
Lovrich & Pierce, 1984	1	Water policy
Pan, et al., 1994	1	Persian Gulf War
Vis., Kosicki et al., 1993a	1	Crime prevention
B. Moderate/low publicity		
Nazarro, 1989	1	Elderly, health
C. Publicity varied		
Frazier, 1986 [a]	1	Fluoridation technical knowledge
Horowitz, 1992	4	3 types of cancer, pelvic exam content [b]
Pearson, 1993	1	Persian Gulf War
D. Media use/exposure varied		
Berry, 1992	1	Health in general
Brantgard, 1983	2	Local, national campaign topics
Choe, 1986	1	Local/national budget deficits
Gandy & El Waylly, 1985	1	Palestinian-Israeli conflict
Kleinijenhus, 1991	1	Politics in The Netherlands
McLeod & Perse, 1994	1	Current events
Pun, 1991	1	Infographics complexity
Rucinski & Ryu, 1991	1	US role/Nicaragua, R's put into 3 groups
Simmons & Garda, 1982	1	Public affairs
Tichenor, et al., 1987	7	Local issues, community type varied
Tomita, 1989	1	World public affairs topics (single score)
Yows, et al., 1991	1	Cancer in general
E. No variation in media publicity/use		
Fredin, et al., 1994	1	School issues (Media credibility, image)
Narigon, 1992	1	Agricultural topics (Agricultural report subscribers only)
II. No gap found		
A. High publicity		
Vis., Kosicki et al., 1993	1	Crime/homicide rates
B. Publicity varied		
Frazier, 1986	1	Fluoridation, issue knowledge
C. Media use varied		
Zandpour & Fellow, 1992	1	Alcohol-related health problems

a. Some studies mentioned more than once.
b. A "reverse knowledge gap" occurred for pelvic exam content (Horowitz, 1992); the four issues were considered together to evaluate knowledge gap hypothesis.

TABLE 2

Knowledge Gap Findings for Time-trend Studies by Media Publicity or Exposure

	No. of issues		
I. Gap found			
A. High publicity only			
Chew & Palmer 1994	1	Nutrition	1 gap, increased by T2 then decreased by T3
Donohue, et al, 1990	1	Smoking/cause of lung cancer, heart disease.	1 gap increased 1 gap decreased
Horstman, 1991	1	Politics/Germany	2 widening gaps 5 gaps not changing 2 gaps diminishing
Moore, 1987	2	Election issues	1 gap increased, 1 same
Salmon, et al, 1994	1	AIDS/HIV transmission	Some gaps increased, some decreased
Viswanath, Kahn, et al., 1993	1	Nutrition	2 gaps increased 1 gap decreased 1 gap no change
B. Publicity varied			
Griffin, 1990	1	Energy	1 gap declined as media attention declined.
Olien, et al, 1990	1	Public affairs	Community level gaps
Miyo, 1983 (see also Pan, 1990, below)	1	Pres. campaign	Gaps between the newspaper dependent and TV dependent narrowed with publicity at T2, widened at T3 as forgetting occurred faster among TV-dependents (especially the more educated ones)
Pan, 1990 (same data as Miyo, 1983; but different analysis)	1	Pres. campaign	Gap increased by T2 when publicity high; then no change
Minnesota Heart Health Project (MHHP) 1983-1995 (see text listing)	1	Nutrition and cardiovascular disease	
Wanta & Elliott, 1992[a]	1	Magic Johnson, AIDS/HIV	1 gap increased 1 awareness gap/no change

a. They found the gap decreased from T1 to T2, but my analysis of their results shows it increased. Our interpretations differ on how to operationalize "knowledge gap."

TABLE 3
Change in Knowledge Gap Findings in Time-trend Studies

I. Gap found, which increases			No. of issues
A. High publicity only			
	Moore, 1987	Election issues	1
	Horstman, 1991	Politics/Germany	2
	Donohue, et al., 1990	Smoking/lung cancer, heart disease	1
	Salmon, et al., 1994	AIDS/HIV transmission	5
	Viswanath, Kahn, et al., 1993	Nutrition	2
B. Publicity varied			
	Olien, et al., 1990	Public affairs	(a)
	Wanta & Elliott, 1992[b]	Magic Johnson, HIV transmission	1
II. Gap found, which decreases			
A. High publicity only			
	Chew & Palmer, 1994	Nutrition	1
	Donohue, et al., 1990	Smoking/lung cancer, heart disease	1
	Horstman, 1991	Politics/Germany	2
	Salmon, et al., 1994	AIDS/HIV transmission	2
	Viswanath, Kahn, et al., 1993	Nutrition	1
B. Publicity varied			
	Griffin, 1990	Energy (gap decreased as media publicity decreased)	1
III. Gap found, which did not change			
A. High publicity only			
	Moore, 1987	Election issues	1
	Horstman, 1991	Politics/Germany	5
	Salmon, et al., 1994	AIDS/HIV transmission	2
	Viswanath, Kahn, et al., 1993	Nutrition	1
B. Publicity varied			
	Wanta & Elliott, 1992[b]	Magic Johnson, AIDS/HIV	1
IV. Mixed gap pattern.			
A. Publicity varied			
	MHHP, 1983-1995	Nutrition & cardiovascular disease	More increases than decreases; some decreases
	Miyo, 1983	Pres. campaign	T2 decrease, T3 increase
	Pan, 1990	Pres. campaign	T2 increase, T3 no change

a. Gaps found between communities, as opposed to between individuals.
b. They found the gap decreased from T1 to T2, but my analysis of their results shows it increased. Our interpretations of operational definitions of knowledge gap differ.